

the wall by an angle frame.

In view of these problems of the state of the art, the invention is based on the task of providing a door of the type described above which, first, can be installed easily and which, second, can be operated without risk of injury, and also on the task of providing a guide rail arrangement for a door of this type.

These tasks are accomplished according to the invention by an elaboration of the known doors, which is characterized essentially in that the guide rail arrangement is provided with at least one protective element, which can be attached to the rail element and/or to at least one of the fastening elements and which serves to bridge the gap between the rail element and the wall.

These types of doors are especially easy to install, because the rail element with the individual fastening elements can be attached to the wall without the use of bulky and difficult-to-handle angle frames. The risk of injury from doors according to the invention is reduced in that, after the rail element has been mounted on the wall by means of the fastening elements, a protective element, which bridges the gap between

the rail element and the wall, is attached to the rail element and/or to at least one of the fastening elements and thus prevents anyone from reaching into this gap and running the risk of injury from contact with the tensioning means. It was realized within the scope of this invention that the increase in the number of construction elements associated with the use of the additional protective element is easy to accept in view of the greater ease of installation thus achieved. The protective element can be produced with less material than conventional angle frames, because the protective element is required only to bridge the gap between the rail element and the wall, there being no need for an additional mounting sidepiece for attaching the protective element to the wall. For this reason, the inventive door can also be produced at lower cost than the conventional doors equipped with angle frames.

For the purpose of making it easier and less expensive to install and remove an inventive door, it has been found to be especially favorable for the protective element to be removably attached to at least one of the fastening elements and/or to the rail element.

The scope of this invention is also intended to include the

use of protective elements which can be attached in a positive or a nonpositive manner to the rail element and/or to the fastening element. It is especially easy to install a protective element, however, if it can be attached positively to the fastening element and/or to the rail element.

As already explained above, the fastening elements of the inventive doors can be in the form of angle pieces with two sidepieces enclosing an angle of preferably about 90° with each other, where the first sidepiece can be attached to the wall and the second to the rail element. In this case, it is very easy to connect the protective element positively to the fastening element without the use of additional components by providing the second sidepiece with a receiving area to accept a fastening area of the protective element, where the receiving area can be in the form of a pressed-out section in the second sidepiece. In this case, the protective element can be secured very reliably to the fastening element by providing a boundary surface of the fastening area with a profiling which arrives in contact with a boundary surface of the second sidepiece of the fastening element and which opposes the separation of the protective element from the fastening element. This profiling

can be in the form of hooks or simple webs which taper to a point on the boundary surface of the fastening area.

To improve the visual appearance and to achieve a further increase in the operating reliability of the inventive door, it is preferable for the protective element to have a cover area, where an intermediate space, which is designed to receive fastening elements serving to fasten the rail element to the second sidepiece, is formed between a boundary surface of the second sidepiece of the fastening element opposite the rail element and the cover area. The fastening means used to fasten the rail element to the second sidepiece can be in the form of screw bolts passing through the rail element and the second sidepiece with nuts screwed onto them, where these nuts can be accommodated in the intermediate space formed between the cover area and the second sidepiece of the fastening element. This has the effect of reducing the risk of injury from the nuts, which would otherwise be exposed.

The protective element of an inventive door has no load-bearing function. Therefore, it can be produced inexpensively out of plastic. As already explained above, this invention can be used to particular advantage in sectional doors, in which the

door leaf has a plurality of panels, which are hinged to each other along axes which are more-or-less perpendicular to the rail element.

As can be derived from the preceding explanation of the inventive doors, a guide rail arrangement suitable for the production of these types of doors, which arrangement has a rail element which can be attached to a wall and a fastening arrangement comprising a plurality of fastening elements which can be attached on one side to the wall and on the other side to the rail element, is characterized essentially in that at least one protective element is provided which can be attached to the rail element and/or to at least one of the fastening elements and which serves to bridge the gap between the rail element and the wall.

The invention is explained below with reference to the drawing, to which explicit reference is made with respect to all of the details which are essential to the invention but not discussed in detail in the specification. The single figure of the drawing shows a horizontal cross section through an inventive door in the area of the more-or-less vertical rail element.

The door shown in the drawing comprises a door leaf with a plurality of panels hinged to each other, only one of these panels 10 being shown in the drawing; a guide rail arrangement with a more-or-less vertical rail element 20 parallel to the lateral edge of the door leaf when the door is closed; a plurality of fastening elements 30 for attaching the rail element to a wall containing the opening to be closed by the door leaf; and a protective element 40.

A guide roller 12, which is held in the rail element 20, is attached to the panel 10, so that the movement of the door leaf can be guided by the guide roller 12 accommodated in the rail element 20. The fastening element 30 is designed in the form of an angle piece with a first sidepiece 32, which is attached by means of a screw 33 to the wall, and a second sidepiece 34, which forms a right angle to the sidepiece 32. To attach the rail element 20 to the second sidepiece 34 of the fastening element 30, two screws 35 in all are provided, which pass through the rail element 20 and this second sidepiece 34. Nuts are screwed onto the ends of these screws 35 facing away from the rail element 20 to ensure a reliable attachment of the rail element 20 to the second sidepiece 34 of the fastening element

30. The rail element 20 is attached to the wall by a plurality of fastening elements 30 of the type shown in the drawing, where a predetermined spacing is maintained between the individual fastening elements 30.

To bridge the gap remaining between the rail element 20 and the wall, a protective element 40 is provided. This protective element 40 can be pushed onto the fastening elements 30 after the rail element 20 has been fastened to the wall by means of the fastening elements 30. For this purpose, the second sidepiece 34 of the fastening element 30 has a pressed-out section 36, which forms a receptacle for a fastening area 42 of the protective element 40. This fastening area 42 is designed in the form of a web, which is more-or-less parallel to the second sidepiece 34. On the boundary surface facing the second sidepiece 34, the fastening area 42 is provided with a profiling in the form of webs 43, which taper down to a point; these webs prevent the protective element 40 from being pulled out of the receptacle formed by the pressed-out section 36. Adjacent to the fastening area 42, the protective element 40 has an outward-slanting web 45, which merges with a web 44, parallel to the second sidepiece 34; the web 44 merges in turn with a web 48

extending toward the second sidepiece 34. This has the result of creating a cover area, which, together with the boundary surface of the second sidepiece 34 opposite the rail element 20, creates an intermediate space 50, in which the nuts 35 are accommodated. In addition to the cover area, the protective element has a protective area 46, which proceeds from the sidepiece 45 toward the wall, parallel to the second sidepiece 34 of the fastening element 30; this protective area bridges the gap formed between the rail element and the wall. Because the protective element 40 has no load-bearing function, it can be produced of plastic in the inventive embodiment shown in the drawing.

The invention is not limited to the exemplary embodiments explained on the basis of the drawing. On the contrary, it includes the use of protective elements which are attached materially or nonpositively to the fastening element and/or to the rail element. In addition, the protective element can also be designed without a cover area. In this case, it is advisable for the protective element to be realized in the form of a U-shaped profile, one of the sidepieces of the protective element being accepted positively in a receptacle of the fastening

element, while the other, longer sidepiece of the protective element bridges the gap formed between the rail element and the wall.